Space Weather Forecast

Issued on Wednesday 19 February 2025 at 01:02 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate flares likely. Slight Chance of G1/Minor Storm on Day 1 (19 Feb) due to CME arrival.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low in the last 24 hours. There are currently eight sunspot regions on the visible disc. One slightly complex region has now rotated off the west limb. A region in the southwest has faded over the last 24 hours and is reverting to a more straightforward magnetic structure. A region in the southeast has shown some growth of intermediate spots, but remains fairly simple magnetically. Also in the southeast, another region has shown some growth in its intermediate portion. The remaining regions appear relatively simple at present.

No Earth-directed Coronal Mass Ejections (CMEs) have been observed. Some instability was observed in the southwest starting around 18/0000 UTC, but no CME is apparent in available imagery.

Solar Wind / Geomagnetic Activity: Solar winds showed coronal hole fast winds. Wind speeds were slightly elevated or elevated, varying between 450-540 km/s. Interplanetary Magnetic Field was mostly weak, but recently reached moderate due to arrival of a CME, which left the Sun 14-15 Feb. The north-south component varied weakly, but recently became moderately negative (southward) due to the aforementioned CME arrival. Geomagnetic activity was Quiet to Unsettled (Kp 1-3), with an Active interval at 18/2100-0000 UTC, due the CME arrival.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) persisted at background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to be Low to Moderate, with isolated Moderate class flares likely.

Solar Wind / Geomagnetic Activity: There are no CMEs currently assessed as Earth directed. However, a glancing CME was observed arriving at L1 at 18/1930 UTC, with a steady rise in the solar wind speeds to near 500km/s. The CME probably left the Sun during the 14-15 Feb. Otherwise, slightly elevated solar wind speeds are expected to gradually ease to background as the influence of CH15/- wanes. Geomagnetic activity will be mostly Quiet to Unsettled with a

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chance of Active intervals early on Day 1 (19 Feb) due to the aforementioned recent CME arrival, and a Slight Chance of a G1/Minor Storm.

Energetic Particles / Solar Radiation: The count rate of energetic particles is forecast to persist at background levels. However, there is a slightly increasing risk of proton flux rising in response to any larger flares, as the current sunspot regions move westwards into a better position for proton events to be seen at Earth.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	1	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	No	40	50	60	60
Very Active	R3-R5 (X Class)	No	5	5	5	5

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	10	10	10	10
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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